

# DOE Evaluation of/Design for Beyond Design Basis Events Breakout Session

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# Establishing a Common Understanding



- ▶ 1. What outcome or measure of effectiveness is expected of controls established to address Design Basis Events?

# Establishing a Common Understanding



- ▶ 2. What outcome or measure of effectiveness should be expected of controls established to address Beyond Design Basis Events (BDBEs)?

# Establishing a Common Understanding



- ▶ 3. What are your reasons for classifying some events as Beyond Design Basis Events instead of Design Basis Events?

# Establishing a Common Understanding



- ▶ 4. What are your reasons to dismiss (i.e. not to analyze) a BDBE, and do you have an upper limit, what is that basis?

# Establishing a Common Understanding



- ▶ 5. What are your reasons not to establish controls for BDBEs that have been analyzed and, if unmitigated, could result in significant consequences?



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- ▶ 6. Assuming you create a list of BDBEs to be analyzed, to what extent should they be analyzed and how should the rigor of analysis be graded?

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- ▶ 7. Should BDBEs consider the results of events that affect:
  - a. Multiple facilities at a site?
  - b. All facilities at a site?
  - c. An entire locality (such as a tornado)?
  - d. An entire area (such as a large wildfire or earthquake)?
  - e. An entire region or country (such as warfare or an economic and infrastructure collapse)?



# Establishing a Common Understanding

- ▶ 8. To what extent should BDBEs consider coincident but potentially independent abnormal events (e.g. combination of earthquake followed by a tornado, facility-wide fire coincident with a loss of offsite power, or coincident with an off-site fire that occupies off-site fire response personnel)?

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- ▶ 9. Should BDBEs consider multiple, partially dependent errors or failures of identified controls leading to or aggravating an accident (e.g. failure of fire suppression system upon demand)?

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- ▶ 10. Should BDBEs consider simultaneous accidents at multiple facilities on a site that place demands upon the same resources (e.g. two separate facility fires that draw upon the same on-site water supply and fire response resources) and analyze the effect of the competition for resources?

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- ▶ 11. Should BDBEs consider protracted loss of offsite resources (such as extended absence of water, electrical, natural gas) and impacts on such systems as cooling and heating systems over protracted periods that could result in a hazardous material release?

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- ▶ 12. If controls are established for BDBEs for a single facility, how should they be classified, how should their effectiveness be analyzed, where should they be documented, and how should they be maintained?

# Establishing a Common Understanding



- ▶ 13. If a BDBE simultaneously affects multiple facilities, where should controls to address the BDBE be maintained?



# Establishing a Common Understanding

- ▶ 14. If a control for a DBE would adequately address a BDBE, although not specifically designed for the BDBE, under what circumstances should the control design specifications be upgraded to address the BDBE?

# Establishing a Common Understanding



- ▶ 15. If a control for a DBE would adequately control a BDBE, but would be classified differently for the two events, which classification should take precedence?

# General and Implementation



- ▶ 1. DOE issued a safety bulletin in March 2011 soliciting input from all of their Hazard Category 1 and 2 nuclear facilities. The inputs we received had some common themes regarding BDBEs—in some cases events were not considered as BDBEs because they were not credible—although larger natural phenomena or operational events could occur. Part of this was due to verbiage in DOE-STD-3009 regarding beyond design basis events. As we go forward to revise the definition and clarify the wording in DOE-STD-3009, do you have suggestions on how we can convey the additional events we would like evaluated but consistently apply common approaches?

# General and Implementation



- ▶ 2. As we considered beyond design basis events, one of the actions we are learning concerns the decision making processes that were used at key times to stabilize the situation after the event occurred.
- ▶ a. Do you believe that DOE vets its decision making at the appropriate levels for BDBEs?

# General and Implementation



- ▶ 2.b. What improvements could we adopt to improve our decision-making for responding to these types of events? For example:
  - ▶ i. Would decisions with serious consequences, such as intentional release of radioactivity to prevent hydrogen build-up, be made in DOE at appropriate management levels?
  - ▶ ii. Do DOE decision-makers in such circumstances have appropriate expertise to make those decisions, or an iron-clad method to ensure access to personnel with that expertise in the sort of panic and disorganization that exists during wide-spread disasters?
  - ▶ iii. Are there actions to take to ensure such necessary expertise is available in the short time available?
  - ▶ iv. A similar set of circumstances following TMI-1 bolstered the NRC's resident program, to ensure expertise with the particular reactor is available. Is DOE's FR program equivalent? What are your suggestions on how it can be improved?



# General and Implementation



- ▶ 3. For coincident BDBEs:
  - a. Does DOE's approach to BDBE provide sufficient assurance that bounding scenarios sufficiently address multiple-event scenarios?
  - b. Do sufficient requirements exist to ensure that sufficient fuel is available if roads are impassable?



# General and Implementation



- ▶ 4. Frequently the worst scenario at DOE sites involves transportation accidents. Since there is no structure, mitigation involves rapid clean-up. That would not be possible if the roads became impassable, and support was not available.
  - a. Are there sufficient DOE requirements to address this situation?
  - b. Do you have suggestions on how DOE might approach BDBE for on-site transportation?

# General and Implementation



- ▶ 5. Do DOE emergency response requirements address situations in which simultaneous wide-spread external emergency responses are ongoing?
  - a. Do they adequately address situations in which travel, including to the emergency response command facility, is restricted (e.g. do emergency responders have authority to travel through restricted areas to gather)?
  - b. Do DOE requirements address loss of communications capability if electrical power to radio transmitters and telephone connections are lost?
  - c. Do DOE organizations have the capability to respond to these situations?

# General and Implementation



- ▶ 6. One common theme in the responses to the DOE safety bulletin was that facilities evaluated loss of AC power, but did not always consider loss of DC power. DOE has discussed developing a guidance document similar to the NEI B5B guidance.
  - a. What are your thoughts on the development?
  - b. How can we better tailor this document for DOE applications?
  - c. Under what circumstances should complete station blackout be evaluated, and how can we help ensure that a complete station blackout is evaluated for future analyses?

# General and Implementation



- ▶ 7. What other suggestions do you have on how we can improve our approach to BDBE? What are some of your concerns when you evaluate BDBE?